

## A.5 BUILDING SKILLS SUPPLEMENT: FINDING AVERAGE ATOMIC WEIGHT

**Example:** There are three isotopes of neon found on the earth:  $^{20}\text{Ne}$  that accounts for 90.92% of the total,  $^{21}\text{Ne}$ , which makes up 0.2571%, and  $^{22}\text{Ne}$ , which makes up 8.822%. What is the average atomic weight of Ne?

$$\begin{aligned}\text{Atomic weight} &= (\text{weight of isotope}) \times (\text{decimal of percent}) + (\text{weight of isotope}) \times (\text{decimal of percent}) + \dots \\ &= (20) \times (0.9092) + (21) \times (0.002571) + (22) \times (0.08822) \\ &= 18.1840 + 0.053991 + 1.94084 \\ &= 20.1788 \text{ (rounded to least decimal place)}\end{aligned}$$

1.  $^{10}\text{B}$  (19.78%),  $^{11}\text{B}$  (80.22%)
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2.  $^{63}\text{Cu}$  (69.46%),  $^{65}\text{Cu}$  (30.54%)
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3.  $^{69}\text{Ga}$  (60.27%),  $^{71}\text{Ga}$  (39.73%)
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4.  $^{79}\text{Br}$  (50.42%),  $^{81}\text{Br}$  (49.58%)
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5.  $^{85}\text{Rb}$  (72.10%),  $^{87}\text{Rb}$  (27.90%)
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6.  $^{35}\text{Cl}$  (77.30%),  $^{37}\text{Cl}$  (22.70%)
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7.  $^{107}\text{Ag}$  (51.72%),  $^{109}\text{Ag}$  (48.28%)
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8.  $^{28}\text{Si}$  (92.2%),  $^{29}\text{Si}$  (4.7%),  $^{30}\text{Si}$  (3.1%)
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9.  $^{24}\text{Mg}$  (78.70%),  $^{25}\text{Mg}$  (10.13%),  $^{26}\text{Mg}$  (11.17%)
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7. How many neutrons are in each of the following isotopes?  $\rightarrow$   $\begin{matrix} \text{electrons} \\ e^- \end{matrix}$   $\begin{matrix} \text{protons} \\ p^+ \end{matrix}$   $\begin{matrix} \text{neutrons} \\ n \end{matrix}$

a. titanium-46

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b. plutonium-242

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c. seaborgium-263

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d. tungsten-186

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